## ASSIGNMENT 4

Textbook Assignment:

"Refrigeration and Air Conditioning," "Compressed Air Systems,"
"Laundry, Mess Decks, Galley, and Scullery Equipment," "Other
Auxiliary Equipment," and "Lathe and Machining Operations," chapters
5 through 9, pages 5-9 through 9-20.

- 4-1. Which of the following conditions may be caused by excessive buildup of frost on the cooling coils?
  - 1. Low suction pressure
  - 2. High suction pressure
  - 3. Low suction temperature
  - 4. High condensing pressure
- 4-2. The maximum time between defrosting of the cooling coils depends on which of the following factors?
  - 1. Amount of refrigerant in the system
  - 2. Moisture content of the supplies placed in the box
  - 3. Amount of heat to be removed
  - 4. All of the above
- 4-3. You must defrost the cooling coils before the frost reaches what maximum thickness?
  - 1. 1/8 inch
  - 2. 3/16 inch
  - 3. 1/4 inch
  - 4. 5/16 inch

IN ANSWERING QUESTION 4-4, REFER TO FIGURE 5-4 OF THE TEXTBOOK.

- 4-4. Approximately how many inches of mercury represent the difference in temperature between points B and D?
  - 1. 0.200 inch absolute
  - 2. 0.232 inch absolute
  - 3. 0.436 inch absolute
  - 4. 0.640 inch absolute

- 4-5. While you are evacuating and dehydrating a refrigeration system, the vacuum indicator fails to attain 35°F. Which of the following conditions may be the cause of this failure?
  - 1. Lack of lubricating oil in the compressor crankcase
  - 2. Lack of moisture in the system
  - 3. Presence of R-12 in the lubricating oil
  - 4. Each of the above
- 4-6. To be properly reactivated, dehydrating agents should be heated (a) at what specific temperature and (b) for what approximate length of time?
  - 1. (a) 200°F; (b) 12 hr
  - 2. (a) 300°F; (b) 12 hr
  - 3. (a)  $400^{\circ}F$ ; (b) 6 hr
  - 4. (a) 500°F; (b) 6 hr
- 4-7. If you do not have a tank-type cleaner, you can clean an R-12 system by which of the following methods?
  - By flushing boiling water through the system three times
  - 2. By blowing hot air through the system for 24 hours
  - 3. By inserting a hard, wool felt filter in the suction strainer screen and operating the plant
  - 4. Each of the above methods
- 4-8. On the two-position, dual control (2PD), which of the following system types uses one common cooling coil to service several different spaces?
  - 1. 1
  - 2. 2
  - 3. 3

- 4-9. What technique must you use to clean the sensing elements in the humidistats?
  - 1. Use of a soft brush
  - 2. Use of gently blown air
  - 3. Use of a spray of soap and water solution
  - 4. Use of a hard brush
- 4-10. To correct a low condensing pressure in an operating refrigeration system, you should perform which of the following actions?
  - 1. Reduce the water supply
  - 2. Increase the water pressure
  - 3. Clean the valves and the valve seats
  - Adjust the high-pressure cutout switch
- 4-11. Insufficient refrigerant in a refrigeration plant may cause which of the following problems?
  - 1. High discharge pressure
  - 2. Low suction pressure
  - 3. Frosting of the crankcase
  - 4. High temperature of the overboard water
- 4-12. Which of the following actions should you take to correct a low condensing pressure in a refrigeration system?
  - 1. Add refrigerant
  - 2. Purge the condenser
  - 3. Increase the compressor speed
  - 4. Adjust the thermostatic expansion valve
- 4-13. In an R-12 refrigeration plant, a compressor runs continuously. What is the probable cause?
  - 1. An open solenoid valve switch
  - 2. An inadequate supply of refrigerant
  - 3. Clogged condenser tubes
  - 4. An excess of liquid refrigerant

- 4-14. Which of the following symptoms indicates that an inadequate supply of water is passing through the condenser of a refrigeration plant?
  - Excessively low temperature of the overboard water and low discharge pressure
  - 2. High suction pressure and high temperature of the suction line
  - 3. High condensing pressure and compressor short cycling on the high-pressure switch
  - 4. High suction line temperature and high discharge pressure
- 4-15. The cut-in point is set too high on the low-pressure control switch of an R-12 refrigeration system. How will this effect the functioning of the compressor?
  - 1. It will short cycle
  - 2. It will not operate
  - 3. It will operate unloaded
  - 4. It will operate continuously
- 4-16. Which of the following conditions is probably caused by liquid refrigerant slugging back to the compressor crankcase of a refrigeration system?
  - 1. Bubbles in the refrigerant
  - 2. A sudden loss of oil from the crankcase
  - 3. The compressor continues to operate unloaded
  - 4. Failure of oil to return to the compressor crankcase
- 4-17. Aboard Navy ships, in which of the following situations would you most likely use MP air?
  - 1. To clean machinery
  - 2. To start diesel engines
  - 3. To operate pneumatic tools
  - 4. Each of the above

- What type of air dehydrator is used 4-18. to reduce dust problems produced by the other various types?
  - Refrigeration (type I)
  - 2. Desiccant (type II)
  - 3. Activated alumina beads
  - 4. Combination refrigeration and desiccant (type III)
- Which of the following statements 4-23. 4-19. is correct about the dehydrator dew point readings?
  - 1. They are taken only to verify suspected operational problems
  - 2. They are taken every 8 hours of dehydrator service
  - 3. They are taken as required by the PMS
  - 4. They are taken every 4 hours of dehydrator service
- Which of the following statements 4-20.describes the recommended procedures for cleaning an oil-wetted filter element that was removed from a compressor intake?
  - 1. Clean with gasoline or kerosene, dip in lightweight 4-24. What material is used to repack the oil, and drain excess oil
  - 2. Clean with steam or strong sal soda solution, dip in clean medium viscosity oil, and drain excess oil
  - 3. Clean with a jet of hot water, dip in kerosene, and drain excess kerosene
  - 4. Clean with kerosene, drain excess kerosene, dip in medium viscosity oil. and drain excess oil
- 4-21. Leakage through the discharge valves of an air compressor is usually caused by which of the following factors?
  - 1. Dirt in the valves
  - 2. Moisture in the air
  - 3. Overcompression of air in the cylinders
  - 4. Insufficient compression of air in the cylinders

- 4-22. Carbonized air compressor valves should be cleaned by soaking them in which of the following solvents?
  - 1. Gasoline
  - 2. Solution of kerosene and mineral oil
  - 3. Kerosene only
  - 4. Strong soda solution
- When you are inserting valves in a compressor cylinder, in which of the following directions should the (a) discharge valves and (b) suction valves open?
  - 1. (a) Toward the center;
    - (b) away from the center
  - 2. (a) Away from the center of the cylinder;
    - (b) toward the center
  - 3. (a) Toward the center of the cvlinder;
    - (b) toward the center of the cvlinder
  - 4. (a) Away from the center of the cvlinder;
    - (b) away from the center of the cylinder
- filter of air compressor control valves?
  - 1. Wool
  - 2. Cotton
  - 3. Linen
  - 4. Nylon
- 4-25. Which of the following valves of a compressed air system is vital for its safe operation?
  - 1. Control
  - 2. Discharge
  - Suction
  - 4. Relief
- 4-26. Which of the following checks is NOT a requirement during an inspection of a washing machine?
  - 1. Test for correct steam pressure
  - 2. See that the bolts, nuts, and screws are tight
  - 3. Ensure the machine is level
  - 4. See that the latches on the cylinder doors work properly

- 4-27. A well-maintained and properly used 4-32. You should inspect distilling plant tumbler will dry a load of laundry in what minimum amount of time?
  - 1. 10 minutes
  - 2. 20 minutes
  - 3. 30 minutes
  - 4. 40 minutes
- Steam kettles safety valves are set 4-33. to release at what pressure?
  - 1. 15 psiq
  - 2. 25 psig
  - 3. 35 psiq
  - 4. 45 psig
- Varied operating conditions of the 4-29. distilling plants are a primary cause of which of the following problems?
  - 1. Changes in feed level
  - 2. Scaling of evaporator tubes
  - 3. Improper liquid level in the first-effect tube nest
  - 4. Excessive steam pressure
- You are making adjustments on 4-30. distilling plant controls to bring heat and fluid conditions into balance. Which of the following techniques should you use?
  - 1. Adjust all controls simultaneously
  - 2. Adjust all heat controls one at a time and quickly
  - 3. Adjust controls one at a time and in small adjustments
  - 4. Adjust each control at 10-minute intervals
- 4-31. Which of the following factors is NOT likely to cause a decrease in the distilling plant's efficiency?
  - 1. Air leaks in the first-effect tube nest
  - 2. Low vacuum in the last-effect shell
  - 3. Dirty circulating water strainer
  - 4. No undue deposits inside the tubes

- steam orifices a minimum of how often?
  - 1. Monthly
  - 2. Twice a year
  - 3. Annually
  - 4. At each overhaul
- From which of the following sources should you take water to be used to desuperheat live steam?
  - 1. The first-effect tube nest drain pump
  - 2. The second-effect tube nest drain pump
  - 3. The freshwater supply
  - 4. The steam feed system
- 4-34. Fluctuations in the first-effect steam pressure and temperature will cause similar fluctuations in which of the following parts of the plant?
  - 1. The second-effect shell only
  - 2. The steam supply line only
  - 3. The water levels only
  - 4. The entire plant
- 4-35. When you keep the vacuum in the first-effect tube nest of a distilling plant as high as possible, you will reduce which of the following factors?
  - 1. The amount of brine pumped overboard
  - 2. The pressure rate of the steam lines
  - 3. The rate of evaporator tube scaling
  - 4. The rate of distillate formation
  - 4-36. When you cannot feed water into the first-effect tube nest of a distilling plant, you should look for which of the following causes?
    - 1. Scale deposits in the air ejector
    - 2. Scale deposits in the vapor feed heater
    - 3. Obstructions in the feed line
    - 4. Each of the above

- 4-37. Once the distilling plant is in operation, which of the following problems is/are likely to cause priming?
  - 1. A sudden rise of the water
  - 2. A water level that is too high
  - 3. Both 1 and 2 above
  - 4. A sudden drop in the water level
- 4-38. The vacuum gauge readings are nearly identical on the first- and second-effect shells of a distilling plant. What is the most likely cause?
  - Air leaks between the first and second effect
  - 2. Equally low water levels in both effects
  - 3. Equally high water levels in both effects
  - 4. Obstructions in the flow between the first and second effects
- 4-39. Improper venting of evaporator tube nests can cause which of the following problems?
  - 1. Condensation of steam in the 4-44. vapor feed heater
  - 2. Accumulation of air in the tubes
  - 3. Excessive increase of tube nest steam to the distilling condenser
  - 4. Excessive increase of scale deposits on the evaporator tube nest
- 4-40. How much scale preventive compound is needed for each 4,000 gallons per day of distilling plant capacity?
  - 1. 1.0 pint
  - 2. 2.0 pints
  - 3. 3.0 pints
  - 4. 1.5 pints

- 4-41. You have an air leak in the distilling plant last-effect shell and the watch stander has been operating the air ejectors improperly. These conditions can produce which of the following vacuum readings in the last-effect shell?
  - 1. 34 in.Hg
  - 2. 30 in.Hg
  - 3. 26 in.Hg
  - 4. 10 in.Hg
- 4-42. When a distilling plant is in operation, which of the following vacuum tests should you use on joints?
  - 1. Candle flame
  - 2. Air pressure
  - 3. Soapsuds
  - 4. Hydrostatic
- 4-43. You must clean air ejector nozzles with which of the following tools?
  - 1. Special reamer
  - 2. Rat-tail file
  - 3. Sharp scraper
  - 4. Metal hole brush
  - 4-44. The temperature of circulating water has exceeded the allowable 20°F as it passes through the distiller condenser. You know that this situation is not normal. What action should you take first?
    - 1. Clean the air ejectors
    - 2. Inspect the condenser circulating water systems
    - 3. Check for improper operating procedures
    - 4. Reset the back pressureregulating valve

- Which of the following indicators 4-45. suggest(s) improper drainage of the distiller condenser?
  - 1. The flash chamber gauge line is flooded
  - 2. The first-effect tube nest vacuum is several inches of
  - 3. The plant does not produce the designed output when the orifice is 5 psiq
  - 4. Each of the above
- 4-46. All sources of troubles in electrohydraulic systems fit into one of three categories. Which of the following is NOT a category?
  - 1. Hydraulic
  - 2. Cooling
  - 3. Electrical
  - 4. Mechanical
- What is the recommended method for 4-47. locating small internal leaks in hydraulic systems?

  - Use magnetic flux
     Install pressure gauges
  - 3. Listen for identifying sounds
  - 4. Visually inspect the disassembled parts
- 4-48. A popping or sputtering noise in a hydraulic system indicates which of 4-53. the following conditions?
  - 1. An oil leak in the pressure line
  - 2. An air leak in the pressure line
  - 3. An air leak in the suction line
  - 4. An air pocket in the cylinder
- 4-49. Which of the following conditions should you suspect if a pounding or rattling noise occurs in a hydraulic system?
  - 1. Overtight adjustment of parts
  - 2. Defective spring-activated valve
  - 3. Improperly adjusted relief
  - 4. Overloaded system or high-speed operation

- 4-50. Foreign matter in the oil of a hydraulic transmission usually causes which of the following types of noise?
  - 1. Rattling
  - 2. Popping
  - 3. Squealing
  - 4. Grinding
- 4-51. When a squealing or squeaking noise occurs in a hydraulic system, it is usually caused by which of the following conditions?
  - 1. Wiped bearings
  - 2. Air pocket in the cylinder
  - 3. Overtight packing around moving parts
  - 4. Overloaded system during highspeed operation
- 4-52. What should you, as an Engineman, do upon discovering a faulty operation of a circuit breaker of a hydraulic system?
  - 1. Repair the circuit breaker
  - 2. Check for excessive binding in the electric motor
  - 3. Replace any damaged equipment in the plant
  - 4. Report the condition to the Electrician's Mate
- If a hydraulic system is left to idle for a long period of time, which of the following difficulties might you expect to develop?
  - 1. Misalignment of linkage
  - 2. Accumulation of sludge
  - 3. External leakage
  - 4. Internal leakage
- 4-54. What is the purpose of securing a hydraulic system for 1 hour after filling it with clean oil?
  - 1. To permit the settling of foreign matter
  - 2. To dissolve the sludge
  - 3. To permit the venting of air
  - 4. To dissolve corrosive deposits

- 4-55. Which of the following actions is a 4-59. Which of the following conditions part of the procedure for cleaning a hydraulic system?
  - 1. Allow the system to remain idle for 15 minutes after operating it with a light load for 4 minutes
  - 2. Operate the system for 1 hour while it is filled with cleaning fluid
  - 3. Operate the system at high pressure while it is filled
  - with cleaning fluid

    4. Dilute the old hydraulic oil
    with cleaning fluid and operate
    the system for 15 minutes, then for about 5 minutes
- You are replenishing the hydraulic 4-56. system with oil. What strainer should you use with the oil?
  - 1. A cheese cloth
  - 2. An aluminum filter
  - 3. A 200-mesh wire screen
  - 4. A 400-mesh wire screen
- 4-57. If you are filling a hydraulic system and notice water in the oil, which of the following actions should you take?
  - 1. Centrifuge the oil or reject it 4-62.
  - 2. Run the oil through a 180-mesh wire screen
  - 3. Heat the oil to permit the water to evaporate
  - 4. Allow the oil to stand until the water settles to the bottom
- 4-58. What material is used to form the shaft seal of most modern hydraulic pumps?
  - 1. Rubber
  - 2. Neoprene
  - 3. Asbestos
  - 4. Flax

- can cause the packing of a shaft stuffing box to wear out quickly?
  - 1. Hard packing
  - 2. Rough shaft
  - 3. Shaft deflection
  - 4. Excessive packing
- 4-60. What is the main purpose of packing a shaft packing gland uniformly and lightly?
  - 1. To allow for cooling and lubrication

  - To prevent scoring of the shaft
     To prevent leakage of seawater
  - 4. To prevent binding of the shaft
- 4-61. A routine inspection revealed a leak in the line of a hydraulic system at a flanged joint. If the leak persists after you have tightened the bolts evenly, what corrective action should you take next?
  - 1. Replace the flange
  - 2. Install new packing
  - 3. Inspect the fluids for contaminants
  - 4. Install square-braided asbestos packing
- The relief valve in a hydraulic system leaks. What should you do to the valve seat?
  - 1. Reface it
    - 2. Replace it
    - 3. Regrind it
    - 4. Fit the valve with a seat insert
- 4-63. The selector switch on the conveyor is improperly set. Which of the following troubles is most likely to occur?
  - 1. Conveyor will not start
  - 2. Conveyor will not hoist
  - 3. Conveyor will run continuously
  - 4. Conveyor will not lower

- 4-64. should NOT be used for which of the following jobs?
  - 1. Turning and boring
  - 2. Facing and thread cutting
    3. Drilling and grinding

  - 4. Bending and shaping
- In ships with a one lathe allowance, what is usually the size of the lathe?
  - 1. 14 in.
  - 2. 16 in.
  - 3. 18 in.
  - 4. 20 in.
- When an engine lathe is used for 4-66. mounted on which of the following lathe parts?
  - 1. Headstock
  - 2. Tailstock spindle
  - 3. Carriage
  - 4. Faceplate
- 4-67. On an engine lathe, which of the following operations is usually performed with the carriage locked in position?
  - 1. Turning
  - 2. Facing
  - 3. Boring
  - 4. Drilling
- 4-68. Gears in the apron of an engine lathe are driven by which of the following lathe parts?
  - 1. Control rod
  - 2. Lead rod
  - 3. Reverse rod
  - 4. Feed rod
- Which of the following cutter bits 4-69. is sometimes ground flat on top so it may be fed in both directions?
  - 1. Left-hand turning tool
  - 2. Right-hand facing tool
  - 3. Square-nosed parting tool
  - 4. Round-nosed turning tool

- The engine lathe in a machine shop 4-70. What type of lathe chuck can be used to automatically center round workpieces of many sizes?
  - 1. Scroll chuck
  - 2. 4-jaw chuck
  - 3. Standard collet chuck
  - 4. Hexagonal collet chuck
  - 4-71. A carriage stop may be used on an engine lathe to eliminate the need for which of the following actions?
    - 1. Individual measurements of duplicate parts
    - 2. Manually shutting off the automatic feed
    - 3. Setup measurements made directly on the workpiece
    - 4. Variable rates of feed across a workpiece
  - Which of the following lubricants 4-72. is to be used for general machine work on brass or Monel rods?
    - 1. Mineral lard oil
    - 2. Turpentine
    - 3. Soluble oil
    - 4. White lead
  - 4-73. What lathe accessory is used for mounting odd-shaped workpieces that cannot be turned between centers?
    - 1. Mandrel
    - 2. 3-jaw chuck
    - 3. Collet chuck
    - 4. Faceplate
  - 4-74. A depth of cut of 0.040 inch reduces the diameter of a lathe workpiece by what measurement?
    - 1. 0.020 in.
    - 2. 0.040 in.
    - 3. 0.080 in.
    - 4. 0.120 in.

- 4-75. Shoulders are commonly located with a parting tool to eliminate the need for which of the following steps?
  - 1. Using a pointed turning tool
  - Facing the shoulder
     Cutting a fillet

  - 4. Measuring during the rough turning

#### STUDENT COMMENT SHEET

THIS FORM MAY BE USED TO SUGGEST IMPROVEMENTS, REPORT COURSE ERRORS, OR TO REQUEST HELP IF YOU HAVE DIFFICULTY COMPLETING THE COURSE.

# NOTE: IF YOU HAVE NO COMMENTS, YOU DO NOT HAVE TO SUBMIT THIS FORM.

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Subj: NRTC ENGINEMAN 2, NAVEDTRA 82149

1. The following comments are hereby submitted:

#### PRIVACY ACT STATEMENT

Under authority of Title 5, USC 301, information regarding your military status is requested to assist in processing your comments and in preparing a reply. This information will not be divulged without written authorization to anyone other than those within dod for official use in determining performance.

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# DEPARTMENT OF THE NAVY

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